

CH302 Spring 2007 Worksheet 6+

1. How many mL of a 0.1 M solution of $\text{Ca}(\text{OH})_2$ are required to neutralized 200 mL of a 0.2 M solution of HNO_3 ?

2. The pK_a of the amino acid aspartic acid is 4. In a solution in which the $\text{pH} = 7.5$ what fraction of the aspartic acid is protonated?

- A. 0.3%
- B. 7%
- C. 23.4%
- D. 72%
- E. 99.5%

3. At what pH would the aspartic acid be 50% protonated?

4. The K_{sp} of magnesium hydroxide is 1.8×10^{-11} . What is the pH of saturated solution of magnesium hydroxide in 0.01 M HCl?

5. The K_a of formic acid is 1.8×10^{-4} . Suggest a means (concentrations of formic acid and sodium formate) to make a buffer solution with a pH of 4.

6. Does 1 L of your proposed buffer system have the capacity to remain a buffer if you add 10 mL of 1M HCl?

7. If you mix the following four solutions what is the pH of the final solution. 100 mL of 1M HCl, 200 mL of 1 M NaOH, 100 mL of 0.4 M HF, and 400 mL of 0.1 M NaF. The K_a for HF is 7.2×10^{-4} .

8. You attempt to dissolve 0.25 g of PbCl_2 in 50 mL of water. You find that all but 0.03 g dissolves.

What is solubility of PbCl_2 in water in units of g L^{-1} ?

What is the solubility product for PbCl_2 ?